# HELP, I NEED SOMEBODY: AUTOMATIC ACTION AND INACTION

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The goal of behavioral control is of central importance in everyday life. When the production of an unwanted action can have deleterious consequences for perceivers, there is considerable virtue in the possession of a mental system that edits its behavioral products to meet the demands of a challenging world. Accordingly, in an attempt to extend existing work on this topic (e.g., Bargh, Chen, & Burrows. 1996), in the present research we investigated the extent to which the automatic elicitation of action may be moderated by features of the task environment and perceivers' goal states. Our findings were unequivocal. When inhibitory cues were present in the environment (i.e., Experiment 1), or perceivers had a competing goal in mind (i.e., Experiment 2), automatic behavioral priming effects were eliminated. We consider the implications of our findings for recent treatments of behavioral priming and action control.

> The surrounding world influences the outcomes of actions, and those independent influences can change greatly from moment to moment....When external influences change, organisms alter their actions to compensate.
>
> —Powers (1989, p. 25)

Pausing to observe an undergraduate shuffle slowly from the laboratory, one may reasonably speculate on the reason for her locomotive lassitude. Could it be that a wandering imagination, ill-fitting shoe, or ingrown toenail has reduced her walking speed to a veritable dawdle? Although

any one of these factors could potentially account for her rather "pedestrian" progress, the real explanation for her behavior may be considerably less obvious: She is walking slowly because a stereotype of the elderly has recently been activated in mind. Incredible though this may sound, this is precisely the effect that Bargh et al. (1996) demonstrated in their recent article on the automatic elicitation of action. Tucked away in memory are believed to be cognitive structures (e.g., scripts, stereotypes, exemplars) that specify a variety of schema-related behavioral propensities, such as walking speed in the elderly, verbosity in politicians, and intelligence in academics (Bargh, 1990, 1997; Dijksterhuis & van Knippenberg, 1998; Dijksterhuis et al., in press; Macrae et al., 1998; Prinz, 1990; Schank & Abelson, 1977; Smith, 1994). Moreover, all that it apparently takes for one's behavior to be influenced by this information is the preconscious activation (i.e., priming) of the relevant cognitive representation (Bargh, 1989, 1990, 1994, 1997). As Bargh argues, "much of everyday life—thinking, feeling, and doing—is automatic in that it is driven by current features of the environment...without any mediation by conscious choice or reflection" (1997, p. 2).

## ACTION INITIATION

As it turns out, effects of the sort reported by Bargh et al. (1996) are not as remarkable as they may at first appear; instead, automatic behavioral priming is a rather routine consequence of normal cognitive functioning. Indeed, were action to unfold in any other way, life as we know it would be fraught with peril (Bargh, 1997; Norman & Shallice, 1986). For example, by the time one cognized the relatively simple fact that a red light means "depress brake pedal," one's car would already be speeding across the busy intersection. To be able to do just about anything at all (e.g., driving, dating, dancing), action initiation needs to be decoupled from the inefficient (i.e., slow, serial, resource consuming) workings of the conscious mind, otherwise inaction inevitably would prevail (Baars, 1997; Mandler, 1997; Norman & Shallice, 1986). Of course, that behavior can be triggered implicitly has been acknowledged for many years (Bargh, 1990, 1994 1997; James, 1890; Koffka, 1935; Lewin, 1943; Prinz, 1990; Schank & Abelson, 1977). The noteworthy contribution of recent work on the topic, however, has been to provide a detailed cognitive specification of exactly when, how, and why these effects arise in everyday life (see Bargh et al., 1996; Carver, Ganellen, Froming, & Chambers, 1983; Dijksterhuis & van Knippenberg, 1998; Dijksterhuis et al., in press; Macrae et al., 1998; Neuberg, 1988). At the same time, this research has also helped dispel one of social psychology's more enduring myths,

namely that complex actions (and for that matter decision processes) are invariably under perceivers' executive control. As an expansive literature now testifies, this is not necessarily so.

The belief that activation of a mental representation can prompt corresponding behavioral outputs has been championed by some of psychology's most influential thinkers, both past and present (e.g., Bandura, 1977; Bargh, 1997; James, 1890; Koffka, 1935; Mischel, 1973; Norman & Shallice, 1986; Piaget, 1946; Schank & Abelson, 1977). Central to their theorizing is the assumption that action tendencies are represented in knowledge structures, along with other schema-relevant material (e.g., see Prinz's (1990) "common coding" hypothesis). Thus, one's mental representation of vanilla ice cream may contain not only related semantic material (e.g., cold, tasty), but also applicable behavioral information (e.g., eat with fudge sauce). Therefore, when the representation is activated, accessible behavioral information may guide one's actions in a particular direction (e.g., one will reach for fudge sauce rather than maple syrup), which explains why Bargh et al.'s (1996) participants dawdled along the corridor after they had been primed with a stereotype of the elderly. Evidently, their behavior simply corresponded to one of the behavioral implications of the activated schema. On another day, in another paradigm, they could just as easily have demonstrated some other behavioral quirk of the elderly, such as avoiding spicy food, reminiscing about the good old days, or forgetting multiple items in a recall task. In a further demonstration of behavioral priming, for example, Bargh et al. (1996, Experiment 1) showed that participants interrupt an experimenter with unusual rapidity after they have been primed with material pertaining to rudeness. The message that emerges from work of this kind is an important one—people's behavioral outputs can be triggered by factors of which they are completely unaware. Action can unfold, in other words, when the "lights are off and nobody's home."

Understandably, demonstrations of automatic behavioral priming (Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998) tend to ring alarm bells in the minds of many. This is essentially because these consciously unprovoked effects are reminiscent of attempts in subliminal priming to coerce people to engage in various unintended acts, such as drinking Pepsi Cola while watching a movie. The disturbing aspect of this work, of course, is that perceivers may be induced, against their will to perform malevolent actions. As it turns out, there is not a shred of compelling empirical evidence to support the idea that subliminal priming can elicit behavioral effects of this sort (Greenwald, Spangenberg, Pratkanis, & Eskenazi, 1991; Wilson, Houston, &

Meyers, 1998). Similarly, there is little reason to suspect that behavioral priming manipulations should propel people to commit calamitous personal actions. Of course, this is not because these effects play only a trivial role in the causation of action; clearly they are important determinants of behavior (Bargh, 1990, 1997). Rather, it is because their influence is constantly tempered by a variety of other mental events, triggered by a combination of exogenous (e.g., features of the environment) and endogenous (e.g., perceiver goals) factors. As Bargh et al. (1996) note, priming a stereotype of the elderly reduced participants walking speed, it did not encourage them "to go buy condos in Florida" (p. 240). Automatic priming effects, much like any other cognitive event, are moderated by a variety of forces—that is, they are controllable (Bargh, 1997). In the research reported herein that endorses this viewpoint, we investigate how features of the task environment and perceivers' goal states can moderate the automatic elicitation of action.

## ACTION INHIBITION

For an activated behavioral propensity to influence the elicitation of action, a critical processing precondition must be satisfied: There must be a correspondence between the activated mental contents and the environment in which the behavior is to be enacted (i.e., construct applicability, see Higgins, 1996). For example, if one has the primed behavioral tendency to kiss one's secretary, this action will obviously not be initiated if the secretary is absent. Similarly, the activated propensity will not compel one to kiss any other individual who happens to be around (e.g., a pizza delivery person). Behavioral priming demands a critical match between contents of the activated action schema and the current task environment, otherwise inaction will prevail.

The story does not stop here: In complex social settings, correspondence between the primed construct and the behavioral arena is not the only factor that may moderate the automatic elicitation of action. Indeed, it is probable that, even in situations where the criterion of correspondence has been satisfied, inaction may frequently occur. As James (1890) observed, "we have so many ideas that do not result in action. But it will be seen that in every such case, without exception, that is because other ideas present simultaneously rob them of their impulsive power" (p. 525). To return briefly to the previous example, just because the relevant action tendency has been primed (i.e., kiss the secretary) and one's secretary is present, this does not imply that kissing will take place. This is because in most complex settings, environmental features (and their related action tendencies) and cur-

rent goal states also shape one's behavioral outputs. Imagine, for example, a situation in which both one's long-term partner and the secretary are present. In such a setting, it is inconceivable that one would kiss the secretary, despite activation of the relevant action tendency. The presence of one's partner would be sufficient to inhibit the primed propensity to kiss one's colleague. Similarly, even in the absence of one's partner, kissing may fail to ensue. For example, if one has the superordinate goal of not cheating on others, again this would probably inhibit initiation of a foolhardy kiss. In other words, at any particular point in time, a range of internal (e.g., goals, moral guidelines) and external (e.g., situational cues, task context) forces will be competing for the control of one's behavior. These forces, moreover, will frequently have quite antagonistic behavioral implications, some specifying action, others inaction. How, then, does the mind deal with these competing behavioral possibilities?

Most influential accounts of mental functioning posit that multiple behavioral schemas simultaneously compete for the control of behavior. According to Norman and Shallice (1986), for example, behavior is controlled either by the automatic operation of preexisting action schemas (when everything is going to plan), or else by a Supervisory Attentional System (SAS) that assumes executive authority when novel task environments are encountered or higher-order processing objectives are operating. Behavior is typically regulated by the automatic activation of action schemas, thus this explains why overlearned skills (e.g., driving, typing, waltzing) can be executed without the involvement of consciousness (Baars, 1997; Norman & Shallice, 1986). However, when perceivers are confronted with novelty, or conscious processing objectives are in place, the inflexible products of implicit action schemas are no longer appropriate, so behavioral control is passed instead to the SAS. At any point in time, therefore, one will simultaneously be entertaining a variety of behavioral options, some triggered by environmental cues, others by one's current processing objectives. Ultimately, it is the action schema with the strongest activation level that triumphs in this battle for cognitive supremacy and guides one's behavior (Norman & Shallice, 1986; Powers, 1973, 1989). As Shallice (1988) argues: "Selection of a schema occurs if its activation exceeds a given threshold; once selected, it remains active...unless it attains its goal or is actively inhibited by a competitor or by any higher level controlling schema" (p. 333). The process of selection whereby willed and nonwilled actions compete for behavioral control is termed contention scheduling; conflict is resolved through the inhibition of competing action schemas (Norman & Shallice, 1986; Shallice & Burgess, 1993).

Given this analysis of mental functioning, it is interesting to note that recent investigations of automatic behavior (e.g., Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998; Dijksterhuis et al., in press; Macrae et al., 1998) have circumvented any mental battle for action control by placing participants in task environments where primed behavioral constructs (e.g., rudeness—see Bargh et al., 1996, Experiment 1) do not encounter any situational or cognitive impediments to action. As such, participants' behavior is naturally guided by implications of the activated action schema (see Norman & Shallice, 1986). Our intuition, however, is that quite different effects would emerge in situations in which external or internal obstructions to action are present. Following Norman and Shallice (1986), we suspect that these forces play a pivotal role in the regulation of action, essentially because they have the power to promote or inhibit the elicitation of behavior.

Consider, for example, the previously described scenario in which one has been primed to kiss the secretary but one's partner is present. Under these circumstances, a schematic battle for the control of one's behavior will clearly ensue (i.e., should one kiss the secretary or not?). Although the secretary will obviously promote the applicable action tendency (i.e., kissing), the presence of one's partner will serve to inhibit elicitation of this behavior. Thus, forces promoting both action *and* inaction will simultaneously compete for the control of one's behavior. The ultimate resolution of this struggle between opposing cognitive forces will be determined by contention scheduling, with the most accessible action schema driving one's behavior (Norman & Shallice, 1986). Thus, one may proceed to kiss the secretary when one's dentist is present (i.e., weak inhibitory influence) but avoid this action when one's partner is around (i.e., strong inhibitory influence). Similarly, if the secretary is present but one has an urgent need to leave the room (i.e., one needs to visit the toilet or catch a train), again it is unlikely that one would present a kiss. Prevailing goal states obviously compete for the control of action and prioritize one's behavioral outputs. Generally speaking, if impediments to action are sufficiently strong, automatic behavioral priming effects should be eliminated (James, 1890; Norman & Shallice, 1986; Powers, 1973). If indeed the case, this would explain why activated schemas need not prompt behavioral ruin: Actions are constantly moderated (i.e., promoted or eliminated) by features of the task environment and perceivers' prevailing goal states. In the present research, acknowledging this possibility, we investigated the inhibitory effect of environmental features (i.e., Experiment 1) and goal states (i.e., Experiment 2) on the automatic elicitation of action.

# EXPERIMENT 1

## METHOD

*Participants and Design.* Sixty-four female undergraduates participated in this experiment. The experiment had a 2 (prime: help or control) × 2 (Pen Type: normal or leaking) between-subjects design.

*Procedure and Stimulus Materials.* Participants arrived at the laboratory individually, were greeted by a female experimenter, and randomly assigned to one of the treatment conditions. The priming manipulation took the form of a "Scrambled Sentence Test" (Bargh et al., 1996; Srull & Wyer, 1979) presented to participants under the guise of a language task. For each of the 15 items, participants were requested to use the five presented words to produce a grammatical English sentence of four words in length. For each item, the five words were presented in a scrambled order (e.g., grew savings waltz her rapidly). Two versions of the scrambled sentence test were constructed. One was intended to prime the construct of "helpfulness," while the other was a control condition in which no specific construct was activated. In the priming condition, 10 of the 15 sentences contained an adjective or a verb semantically related to helping. The 10 critical priming stimuli were as follows: helped, assistance, aided, supported, provided, encouraging, facilitated, promoted, fostered, and furthered (e.g., she luggage revise him helped). It was anticipated that completing sentences with these words would prime the construct of "helping" in participants (see Bargh et al., 1996). In the control condition, the critical items were replaced by neutral words that were not associated with helping in any way.

Participants were told that they would be participating in two short experiments on language use. The first experiment, it was explained, was an investigation of the construction of grammatical English sentences. After giving their consent to participate in the experiment, participants were handed an envelope that contained one of the versions of the scrambled sentence test. Participants were told to complete the test in their own time (most participants took about 3 minutes to complete the test) and to inform the experimenter, who sat at a desk with her back to the participants when they had finished. Importantly, the experimenter was blind with regard to the priming manipulation. When participants indicated that they had finished the test, the experimenter explained that she would now go along the corridor and get the experimenter who would be conducting the second experiment. The experimenter then collected together her possessions from the desk (a large pile of books, papers, and a small bag) and moved toward the laboratory door. As she

approached the door, however, she accidentally dropped some items from the top of the pile she was carrying.

Depending upon the experimental condition, the dropped items were either regular pens or pens that were leaking (i.e., the barrel and tip of each pen was covered in ink).[1] In a previous pilot task, 20 participants were requested to rate whether picking up various items a person had dropped would be considered helpful. Ratings were provided on a 9-point scale (1 = not at all helpful; 9 = extremely helpful). Importantly, results confirmed that participants believed it would be helpful to pick up both regular pens and leaking pens that were dropped by an individual (respective $Ms$ = 7.45 vs. 7.09, $t(19)$ < 1, $ns$). Notwithstanding this finding, we anticipated that the type of pen dropped would moderate the elicitation of helping behavior. Our reasoning was as follows: Although picking up leaking pens is deemed to be a helpful activity, we suspected that participants would be unwilling to engage in this action because of possible costs involved—that is, getting covered in ink. Thus, in a helping situation we expected the following effects to emerge: Whereas leaking pens should eliminate the automatic elicitation of helping behavior, regular pens should not impede the occurrence of this effect (cf. Bargh et al., 1996). As such, the dependent measure in this experiment was whether or not participants helped the experimenter pick up any of the dropped items. If a pen had not been picked up within 10 seconds, the experiment was terminated. Upon completion of the experiment, participants were debriefed, thanked, and dismissed.

## RESULTS AND DISCUSSION

To evaluate our predictions, a 2 (prime: help or control) × 2 (pen type: normal or leaking) between-subjects analysis of variance (ANOVA)

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1. It is possible that self-directed attention could influence the efficacy of behavioral priming (Macrae et al., 1998). Specifically, if the pen types differ in the extent to which they affect participants' self-focus, then this could explain any differences that emerge in their subsequent helping behavior. For example, it is possible that leaking pens may heighten self-directed attention (e.g., "If I pick up a pen, I'll get messy"), thereby attenuate any automatic priming effect. To evaluate this possibility, we carried out a pilot study where 20 participants were requested to complete a pronoun-idenfication task (Davis & Brock, 1975) immediately after either regular or leaking pens had been dropped on the laboratory floor. Participants were given a Dutch story in which 20 alleged pronouns were underlined and numbered. Their task was simply to guess the correct English translation for each pronoun. Of interest were the number of times participants selected personal pronouns, as this is indicative of their level of self-focus. Importantly, the results confirmed that participants' self-focus was not affected by the type of pen that was dropped, $t(18)$ < 1, $ns$.

TABLE 1. Participants' Helping Rates as a Function of Priming Condition and Pen Type (Experiment 1)

|  | Prime | |
| --- | --- | --- |
|  | Help (%) | Control (%) |
| Pen Type |  |  |
| Normal | 93.7 | 68.7 |
| Leaking | 6.2 | 12.5 |

was undertaken on the data (for ANOVA on binary data, see Kirk, 1982). This revealed a main effect of pen type on participants' helping rates, $F(1,60) = 88.16$, $p < .0001$. As expected, a significant Prime × pen-type interaction also emerged, $F(1,60) = 5.51, p < .03$; see Table 1). Simple effects analyses confirmed our experimental predictions. When normal pens were dropped on the laboratory floor, participants' helping rate was higher in the prime than control condition, $F(1,60) = 7.65$, $p < .008$. In contrast, when the pens were leaking, there was a dramatic reduction in helping rates and no effect of the priming manipulation was observed $F(1,60) < 1$, $ns$. Simple effects analyses also revealed that helping rates were higher for normal than leaking pens in both the prime $[F(1,60) = 68.87, p < .0001]$ and control $[F(1,60) = 24.79, p < .0001]$ condition. These effects clearly demonstrate the inhibitory impact of environmental cues on the automatic elicitation of action (Norman & Shallice, 1986; Powers, 1973). When normal pens were dropped on the floor, primed participants were more likely to help the experimenter than their colleagues in the control condition, an effect that replicates previous research of this kind and reflects the automatic elicitation of action (Bargh et al., 1996). However, when the pens were leaking, this automatic helping effect was eliminated.

## EXPERIMENT 2

Our first experiment confirmed that features of the task environment can moderate the automatic elicitation of action. Although participants were primed to behave in a helpful manner, when obstructions to action were present, inaction (i.e., nonhelping) prevailed. By implication, internal impediments to action (e.g., competing goal states) should also moderate the automatic elicitation of action. Specifically, when primed action tendencies conflict with perceivers' current goal states, executive operations should inhibit the operation of activated behavioral schemas. The contention that higher-order goals can modulate the expression of lower-level behavioral schemas is a basic tenet of Norman and Shallice's (1986) model of action control. As Shallice and Burgess (1993) report, "the

supervisory system...modulates the operation of contention scheduling by providing additional activation or inhibition of schemas competing in the lower-level mechanism" (p. 172). Thus, when sitting at traffic lights, the appearance of a green light normally prompts one to depress the accelerator pedal and move away, an action performed without the involvement of consciousness. When, however, one is intent on annoying the driver behind (e.g., which has stopped about 1 inch away from the bumper), this routinized action can be inhibited, leaving one's car in a stationary position. In this case, a higher-order cognitive goal modulates the effect of lower-level action schemas (Norman & Shallice, 1986). The same must be true, of course in social behavior, with processing objectives inhibiting the effects of primed action tendencies when these forces are in conflict and specify incompatible behavioral outputs. For example, imagine a situation in which one has been primed to be helpful, but one is 5 minutes late for an important appointment (Darley & Batson, 1973). Would one offer assistance to a needy stranger in such a setting? We suspect not, because the current processing objective would inhibit any automatic elicitation of helpful behavior. In our second experiment, with a paradigm based closely on this illustrative example, we investigated this possibility.

## METHOD

*Participants and Design.* Sixty-four female undergraduates participated in this experiment. The experiment had a 2 (Prime: help or control) × 2 (Experimental Status: on time or running late) between-subjects design.

*Procedure and Stimulus Materials.* Participants arrived at the laboratory individually, were greeted by a female experimenter, and randomly assigned to one of the treatment conditions. The experiment was basically a replication of Experiment 1, but with a couple of modifications. Up until the completion of the "Scrambled Sentence Test," the procedure was identical to Experiment 1 (i.e., prime helping vs. no prime). However, when each participant indicated that she had finished the test, the experimenter explained that the participant was now to leave the laboratory and walk to the foyer of the Psychology Department, where the next experimenter would be waiting. As she furnished this instruction, the experimenter looked at her watch and delivered one of two possible messages. For half of the participants, the experimenter announced that the experimental session was running on time. For the others, she intimated that it was running 5 minutes behind schedule. We reasoned that the latter message would encourage participants to get on with things as quickly as possible. The experimenter then collected her belongings and opened the laboratory door so that the participant could

TABLE 2. Participants' Helping Rate as a Function of Prime and Experimental Status (Experiment 2)

|  | Prime | |
| --- | --- | --- |
|  | Help (%) | Control (%) |
| Experimental Status |  |  |
| On time | 100.0 | 75.0 |
| Running late | 12.5 | 12.5 |

leave. As she opened the door, however, the experimenter accidentally dropped some items from the top of the pile she was carrying. For all participants, these items were 10 "regular" pens. The question of interest was whether or not participants would help the experimenter pick up the pens as they left the laboratory. We anticipated that the status of the experimental session would moderate the elicitation of helping behavior. Specifically, whereas an automatic helping effect should emerge when the experimental session was running on time, this effect should be eliminated when the session was 5 minutes behind schedule. The dependent measure was therefore whether participants helped the experimenter or simply left the laboratory without providing any assistance. Upon completion of the experiment, participants were debriefed, thanked, and dismissed.

## RESULTS AND DISCUSSION

To evaluate our predictions, a 2 (prime: help or control) × 2 (Experimental Status: on time or running late) between-participants analysis ANOVA was undertaken on the data. This revealed a main effect of experimental status on participants' helping rates, $F(1,60) = 130.00, p < .0001$. As expected, a significant prime × experimental status interaction also emerged, $F(1,60) = 4.10, p < .05$ (see Table 2). Simple effects analyses confirmed our experimental predictions. When the experimental session was running on time, participants' helping rate was higher in the prime condition than in the control condition, $F(1,60) = 6.15, p < .02$. In contrast, when the session was 5 minutes behind schedule, there was a dramatic reduction in helping rates and no effect of the priming manipulation was observed, $F(1,60) < 1, ns$. Simple effects analyses also revealed that helping rates were higher when the experimental session was on time, than when it was running late in both the prime [$F(1,60) = 86.53, p < .0001$] and control [$F(1,60) = 46.53, p < .0001$] condition.

These effects clearly demonstrate the modulatory impact of perceivers' goals on the automatic elicitation of action (Norman & Shallice, 1986; Powers, 1973). When the experimental session was running on time,

primed participants were more likely to help the experimenter than their colleagues in the control condition. However, when the session was running late (i.e., participants were in a hurry) this automatic helping effect was eliminated. Interestingly, these findings are apparently at odds with Darley and Batson's (1973) classic study, in which helping behavior was unaffected by a priming manipulation (i.e., reading the parable of the Good Samaritan). Closer inspection of their findings reveals a slightly different tale. Compared to participants in the control condition (i.e., no prime), those primed to be helpful were indeed more helpful when the experiment was running on time (respective Ms: 3.80 vs. 1.67; 5-point scale) but not when it was running late (Ms: 1.00 vs. 0.50), precisely the pattern of effects that emerged in the present study. Although not statistically significant, Darley and Batson's (1973) findings are clearly in the predicted direction, and it could simply be that their blatant priming manipulation attenuated the magnitude of the associated helping effect. As demonstrated in the present work, when a covert priming manipulation was employed conceptually comparable effects were observed.

## GENERAL DISCUSSION

### THE GOAL OF CONTROL

Once primed, behavioral schemas can prompt perceivers to perform a variety of actions. For example, participants may interrupt an experimenter with unusual rapidity, emit hostile expressions when asked to repeat a laborious task, dawdle away from the laboratory, articulate a word list at great speed, or perform with distinction on a test of their general knowledge (see Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998; Macrae et al., 1998). These effects are theoretically noteworthy, of course, because they are triggered implicitly. That is, perceivers have no awareness of the causal origins of their behavior. Indeed, if they had instead been probed about why they had just behaved in a particular manner, one suspects that they would simply report plausible a priori explanations for their actions (Nisbett & Wilson, 1977). By necessity, our behavioral repertoire far outstrips our understanding of why things happen as they do, a state of mental ignorance we should celebrate. Were consciousness allowed unimpeded access to the myriad workings of the mind, it is difficult to envisage how we could do anything at all (Dennett, 1991, 1996). Reading a book, riding a bicycle, or ordering a pizza—tasks we ordinarily take for granted and execute with ease—would be impossible if each step in the action sequence (and related decision processes) demanded conscious scrutiny. By denying introspective access to most

of its workings, the mind can respond flexibly and adaptively to the demands of a complex stimulus world (Baars, 1997; Dennett, 1996).

It is not as yet known quite how many ostensibly purposive actions can be triggered automatically. What is certainly the case, however, is that many of behaviors that we routinely ascribe to the workings of deliberative intentional processing in reality require no conscious processing at all (Bargh, 1990, 1997; Bargh et al., 1996; Bodenhausen & Macrae, 1998; Carver & Scheier, 1981; Chartrand & Bargh, 1996; Macrae, Bodenhausen, & Milne, 1998). In a sense, things (e.g., actions, decisions) just happen. Although cognizant of our behavioral outputs, their cognitive origins remain shrouded in mystery. At least in some quarters, this characterization of behavioral initiation is greeted with unease and disquiet. If complex actions bypass consciousness, then surely behavior is no longer regulated by the moral principles that make us what we are—our behavioral outputs are out of control. If priming manipulations can prompt rude and assertive behavior (see Bargh et al., 1996), maybe they can also propel people to engage in decidedly antisocial acts, even if they have no explicit intention to behave in such a manner. To our minds, this viewpoint is seriously flawed as it rests on an untenable assumption. The problem resides in identifying consciousness as the single seat of behavioral control. Although executive processes clearly can, and indeed often do, exert a profound influence on our outputs (see Baars, 1988; Dennett, 1996; Norman & Shallice, 1986; Wegner, 1994), in no sense do they exhaust the possibilities for behavioral control. Indeed, it is probable that most control processes are cognitively impenetrable, operating in the silent world of the unconscious mind. As Baars (1988, p. 253) notes:

> While we speak of conscious monitoring and editing, the fact is, of course, that we are generally not conscious of the rules and criteria by which we do our monitoring. If we find a syntax error in inner speech, we do not consciously say, "Aha! Lack of number agreement between noun and verb!" Not even linguists do that—The rule processes that spot the error are quite silent in their details.

## ON RESISTING ASSISTING: DOING THE RIGHT THING

In the present article, we speculated that the elicitation of automatic action can be moderated by features of the task environment and perceivers' goal states. Our particular emphasis was on how situational cues (and their associated behavioral tendencies) and processing goals can inhibit the effects of activated behavioral schemas (Norman & Shallice, 1986). We obtained considerable support for our predictions.

When participants were primed to be helpful, critical features of the task environment and perceivers' current goals moderated the elicitation of automatic behavior. That is, when the experimenter accidentally dropped "regular" pens on the laboratory floor, primed participants were more likely than their counterparts in the control condition to offer assistance in picking them up (see also Bargh et al., 1996). Quite different results emerged, however, if the dropped items were faulty pens that leaked, or if the experimental session was running behind schedule. Under these conditions, behavioral priming effects were eliminated, thereby demonstrating that the automatic elicitation of action can be moderated by both exogenous (e.g., situational cues) and endogenous (e.g., processing objectives) factors (see Norman & Shallice, 1986).

Inhibitory effects of this sort are just what one would expect in a mental system in which multiple schemas (e.g., action tendencies) compete simultaneously for the control of behavior and tangible costs exist that are associated with the performance of specific actions, ranging from mild embarrassment to a spell in prison (see Carver & Scheier, 1981; Norman & Shallice, 1986; Powers, 1973). Simply stated, an adaptive control system actively prevents the elicitation of inappropriate (or incompatible) actions. In the human behavioral hierarchy, control systems operate on schemas at varying levels of specificity, ranging from those concerned with the regulation of muscular activity (e.g., wiggling a toe) to others that control complex behavior (e.g., kissing one's secretary) in accordance with abstract moral principles (Carver & Scheier, 1981; Powers, 1973). At any given point in time, a variety of these schemas will compete for control of one's behavior, with some action tendencies triggered by internal processes (e.g., goals, ruminations) and others by features of the task environment (Norman & Shallice, 1986). Whether or not a specific action occurs is determined by the relative strengths of the activated schemas, with schemas routinely provoking conflicting behavioral tendencies. The goal of action control is to prevent the elicitation of a contextually unwanted action.

In this framework, it is easy to see how activated schemas need not inevitably lead perceivers to behavioral ruin. If tendencies toward inaction are sufficiently strong, inaction will typically occur. As demonstrated, automatic behavioral effects can be eliminated if sufficiently strong inhibitory cues are present. Thus, under certain circumstances, the behavioral control system will actively prevent perceivers from doing the wrong thing (see Norman & Shallice, 1986). Such a state of affairs is characteristic of life outside the laboratory, at least for most individuals. Having watched a violent movie, one doesn't literally assault the first person who passes by—inhibitory behavioral schemas

see to that. In such a situation, tendencies toward inaction may derive either from the operation of chronic behavioral goals (e.g., don't do harm to others) or from the temporary activation of inhibitory routines cued by features of the immediate environment (e.g., the presence of a police officer). Either way, one's propensity to behave inappropriately (i.e., assault someone) is inhibited. Of course, it should be acknowledged that situational cues and processing goals also possess the ability to promote or facilitate the elicitation of automatic behavior. Following observation of a violent movie, for example, the presence of associated cues (e.g., guns) in the environment can prompt the initiation of aggressive behavior (Berkowitz, 1984; Berkowitz & LePage, 1967). Behavioral control, then, is a competition between activated schemas, with environmental cues and internal psychological states either facilitating or inhibiting the elicitation of action (Norman & Shallice, 1986). Quite how much, when, and for whom primed action tendencies shape behavior, however, are questions that require empirical clarification.

## CONCLUSIONS

Behavioral control is of central importance in social interaction. When an errant response can land one in unseemly trouble, there is considerable value in the possession of a mental system that constantly modifies, updates, and edits its behavioral products. Moreover, to the extent that this system is finely tuned to internal and external cues, the better its prospects of guiding one's actions in a purposive manner (Powers, 1973). Recent work on the automatic elicitation of behavior poses some thorny questions for the operation of such a system (see Bargh, 1997; Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998). In particular, if complex actions are triggered implicitly, how can one ever control them? If awareness is a precursor of control, then surely lack of awareness translates into lack of control—or does it (see Bargh, 1989, 1994, 1997)?

Our intuition is that the resolution of this puzzle is relatively straightforward. Although behavioral control can have its origins in consciousness (see Wegner, 1994), volitional processing is not a necessary precondition for the operation of the system. Indeed, intentional control may be the exception rather than the rule in mental life. More often, behavioral control may be initiated by unconscious processes triggered by the implicit registration of external cues in the immediate task environment (Norman & Shallice, 1986; Powers, 1973). Through action tendencies associated with these cues, behavior can be shaped, cajoled, and guided (i.e., promoted or inhibited) to meet the demands

of an ever-changing stimulus world. In the present article, we have furnished some preliminary evidence for how the dynamic interaction between organism and environment can moderate the elicitation of automatic behavior: A great deal, of course, remains to be discovered. It is evident, however, that if control processes relied entirely upon the slow, serial, resource-demanding workings of the conscious mind, we would rapidly find ourselves in serious trouble. In such a world, kissing the secretary would be the least of our problems.

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